



Standard Specification for Anodic Oxide Coatings on Aluminum¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers requirements for electrolytically formed porous oxide coatings on aluminum and aluminum alloy parts in which appearance, abrasion resistance, electrical properties, and protection against corrosion are important. Nonporous, barrier layer anodic coatings used for electrical capacitors are not covered. Seven types of coatings as shown in Table 1 are provided. Definitions and typical examples of service conditions are provided in Appendix X1.

NOTE 1—It is recognized that uses exist in which modifications of the coatings covered by this specification may be required. In such cases the particular properties desired by the purchaser should be the subject of agreement between the purchaser and the manufacturer.

2. Referenced Documents

2.1 ASTM Standards:

- B 110 Test Method for Dielectric Strength of Anodically Coated Aluminum²
- B 117 Practice for Operating Salt Spray (Fog) Testing Apparatus³
- B 136 Test Method for Measurement of Stain Resistance of Anodic Coatings on Aluminum⁴
- B 137 Test Method for Measurement of Coating Mass per Unit Area on Anodically Coated Aluminum⁴
- B 244 Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and of Other Nonconductive Coatings on Nonmagnetic Basis Metals with Eddy-Current Instruments⁴
- B 368 Test Method for Copper-Accelerated Acetic Acid-Salt Spray (Fog) Testing (CASS Test)⁴
- B 457 Test Method for Measurement of Impedance of Anodic Coatings on Aluminum⁴
- B 487 Test Method for Measurement of Metal and Oxide Coating Thicknesses by Microscopical Examination of a Cross Section⁴

¹ This specification is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.07 on Chemical Conversion Coatings.

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² Discontinued; see 1981 Annual Book of ASTM Standards, Part 9.

³ Annual Book of ASTM Standards, Vol 03.02.

⁴ Annual Book of ASTM Standards, Vol 02.05.

TABLE 1 Anodic Coatings Descriptions

NOTE 1—Hard coatings may vary in thickness from 12 μm to more than 100 μm. If the thickness of Type A is not specified, it shall be 50 μm min. Type A coatings will not be sealed unless so specified.

Type	Coating (Industry) Description	Minimum Film Thickness (μm)
A	Engineering Hard Coat	50
B	Architectural Class I	18
C	Architectural Class II	10
D	Automotive—Exterior	8
E	Interior—Moderate Abrasion	5.0
F	Interior—Limited Abrasion	3
G	Chromic Acid	1

B 538 Method of FACT (Ford Anodized Aluminum Corrosion Test) Testing⁵

B 602 Test Method for Attribute Sampling of Metallic and Inorganic Coatings⁴

D 658 Test Method for Abrasion Resistance of Organic Coatings by Air Blast Abrasion⁶

E 429 Test Method for Measurement and Calculation of Reflecting Characteristics of Metallic Surfaces Using Integrating Sphere Instruments⁶

E 430 Test Methods for Measurement of Gloss of High-Gloss Surfaces by Goniophotometry⁶

2.2 Other Standards:

MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes⁷

MIL-STD-414 Sampling Procedures and Tables for Inspection by Variables for Percent Defective⁷

3. Manufacture

3.1 Defects in the surface of the basis metal, such as scratches, porosity, inclusions, roll and die marks, cold shuts, and cracks, will adversely affect the appearance and performance of applied coatings despite the observance of best anodizing practices. Accordingly, defects in the coating that result from such conditions shall not be cause for rejection.

NOTE 2—To minimize problems of this sort, the specifications covering the basis material or the item to be anodized should contain appropriate limitations on such basis metal conditions.

⁵ Discontinued; see 1986 Annual Book of ASTM Standards, Vol 02.05.

⁶ Annual Book of ASTM Standards, Vol 06.01.

⁷ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.